

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q83437

Katsuya WATANABE, et al.

Appln. No.: 10/506,802

Group Art Unit: 1793

Confirmation No.: 6804

Examiner: Diana J. LIAO

Filed: September 7, 2004

For: HYDRODESULFURIZATION DESULFURIZATION ISOMERIZATION CATALYST,
PROCESS FOR PRODUCING THE SAME, AND METHOD OF DESULFURIXATION
ISOMERIZATION FOR SULFUR HYDROCARBON OIL

DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Takahito Kawakami, hereby declare and state as follows:

I am a citizen of Japan;

I have received a Master's degree from Akita University, Faculty of Mining Engineering,
Department of Fuel Chemistry, in March 1987.

I accepted employment with COSMO OIL CO., LTD. in April 1987, where I have been
engaged in research and development of catalysts.

I am listed as an inventor of the present application and I am thus familiar with the subject matter disclosed and claimed in the application. I have reviewed the Office Action dated November 13, 2008 and am familiar with it.

It is my opinion that the superior results obtained with the catalyst prepared by the claimed method would have been unexpected to a person skilled in the art. It is important that platinum and palladium are differently located in the catalyst, as stated in the specification. Attached please find a copy of the following paper written by authors including the inventors of the presently claimed invention, which contains a clear explanation of the point.

Applied Catalysis A: General 276 (2004) 145-153

Referring to the left column of page 152 of the paper, the text describes the results of mapping analysis by EPMA of the metals in the presently claimed catalyst.

The results of mapping analysis of Zr and Al indicate that Al_2O_3 exists in the spaces among the ZrO_2 particles and works as a binder. Pt was strongly observed where the ZrO_2 particles existed, and was not found where the Al_2O_3 particles existed. On the other hand, Pd was hardly detected where ZrO_2 existed, but its distribution coincided with that of Al_2O_3 , forming $\text{Pd}/\text{Al}_2\text{O}_3$.

These results clearly indicate that the catalyst prepared by the claimed method has a hybrid structure in which the $\text{Pt}/\text{SO}_4^{2-}/\text{ZrO}_2$ particles and the $\text{Pd}/\text{Al}_2\text{O}_3$ particles form a super-neighborhood. Its structure as described is believed to enable the catalyst to exhibit high activity in the isomerization of light naphtha having a high sulfur content. Please refer to paragraph 3.4 on pages 152 and 153 of the paper discussing a mechanism of its high isomerization activity.

DECLARATION UNDER 37 C.F.R. § 1.132
U.S. Application No.: 10/506,802

Attorney Docket No.: Q83437

I am sure that the catalyst having such a special structure and the superior results obtained with it, as explained above, would have been unexpected to a person of ordinary skill in the art.

A practical significance results from the presently claimed invention. It should be noted that an ordinary isomerization catalyst lacks sulfur resistance and cannot be employed for the isomerization of light naphtha unless it is desulfurized to have a sulfur content of 1 ppm or less, but that the presently claimed catalyst is a novel catalyst having sulfur resistance and capable of use in hydrodesulfurization as well as isomerization, as stated in the present specification. See, for example, page 1, lines 9-11.

While both an apparatus for desulfurization and an apparatus for isomerization have hitherto been required to produce a gasoline feedstock having a high octane number, the presently claimed catalyst can be employed in an existing desulfurization apparatus to enable desulfurization and isomerization to be performed simultaneously for the production of a gasoline feedstock having a high octane number without necessitating the construction of any new apparatus, thereby providing a very significant economical advantage.

DECLARATION UNDER 37 C.F.R. § 1.132
U.S. Application No.: 10/506,802

Attorney Docket No.: Q83437

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Aug 6, 2009

Takahito Kawakami
Takahito Kawakami